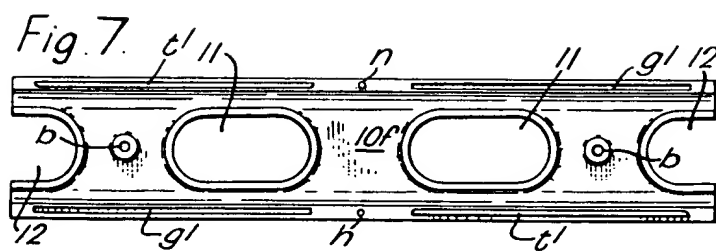


999743 COMPLETE SPECIFICATION
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PATENT SPECIFICATION

DRAWINGS ATTACHED

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Inventor: DAVID DAY

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COMPLETE SPECIFICATION

Constructional Toy

We, HILARY PAGE "SENSIBLE" TOYS LIMITED, a British Company, of Kenley, Surrey, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns a constructional toy primarily for young children. An object of the invention is to provide a toy consisting of a number of units, which units can be assembled to build up a wide variety of structures. Another object of the invention is to provide a constructional toy comprising a number of units of substantially identical form from which a young child can freely create a wide range of built-up structures in two or three dimensions.

According to this invention, there is provided a unit for a structural toy, said unit comprising a rod or bar of non-circular cross-section so as to present a width greater than thickness with at least one hole therethrough with its greatest dimension along the bar and with the cross-sectional shape and dimensioning of the rod and location of the hole therethrough such that a rod or bar can slide fittingly through the or a hole of another rod or bar of identical cross-section, said rod or bar also having a slot in from each end which slots are dimensioned and shaped in relation to the cross-section of the rod or bar, so that a rod or bar can be entered into a slot of another rod or bar at right angles thereto to be retained therein.

It will be understood that the unit must slide reasonably freely into and through the or a hole through another unit. The edges of the hole preferably are chamfered to facilitate easy insertion of a unit into a hole of another unit.

Preferably, the rod or bar has opposite faces which are flat and parallel over a substantial part of their width, with the hole or

holes passing from the one flat face to the other. In this case, the holes will have opposite sides parallel and extending longitudinally of the bar or rod. Thus, each hole is of ovoid shape, with parallel flat opposite sides longitudinally of the bar or rod and outcurved arcuate ends. The cross-section of the rod or bar corresponds, that is to say it has arcuately curved sides, so that it will fit into and pass through a hole of another rod or bar.

According to another feature of the invention, each end slot is of the shape of half a hole, i.e. of D-shape. This permits a first unit to engage a second unit by an end hole, the two units being right angularly disposed, and also a third unit can be joined aligned with the first unit.

It is not, however, essential for the hole shape and bar cross-section to be ovoid. For example, the hole shape and bar cross-section could be oblong, or flat top and bottom with V-side walls. Other shapes obviously are possible.

The units preferably have two holes, although units with a single hole or more than two can be used. In all cases the holes are equally spaced in relation to the end slots, that is to say, the inner end of a slot is spaced from the adjacent end of the adjacent hole the same distance as is the other end of said adjacent hole from the next hole or the other end slot.

The units can be solid, made for instance of wood, but preferably are made from a synthetic plastic material by moulding. The units in such a case are made in two half shells, to fit together by facing edges of the side walls.

Units according to this invention enable many structures to be built up as will be understood from the following description with reference to the drawings accompanying the Provisional specification in which:—

Figure 1 is a plan view of a unit,

[Price 4s. 6d.]

Figure 2 a perspective view of a half shell of a unit,

Figure 3 a sectional view showing two shells united, and the accompanying drawings, in which:—

Figures 4 to 6 show in perspective some structures which can be built with units, and

Figure 7 is a plan view of an alternative and preferred form of half shell.

As shown particularly in Figure 1, the unit consists of a rod or bar 10 having ovoid holes 11, 11, therethrough from two opposite flat and parallel faces 10f, 10f. The mouths of the holes are bevelled at 11a, and the edges 10e of the elements are arcuate (Figure 3). The commencement of the curving from the flat faces is such that a narrow flat border is left along the straight sides of the holes 11 to the curve of the adjacent edge.

A D-slot 12 is made into each end of an element. This is dimensioned so that another element can be entered therein edgewise to be gripped sufficiently firmly to prevent accidental displacement.

Elements or units of half size, i.e. with one through hole, could be provided, as could elements with more than two holes. The space between holes and between the inner end of a slot and its adjacent hole is identical.

Figures 2 and 3 show one example of how the units are built from half shells. The shells are identical, consisting of a flat plate part this being a face 10f and arcuately curving side walls. The edge of one side wall has a tongue *t* projecting, the other edge a corresponding groove *g*. The plate also has two hollow bosses 11a, these when the shells are fitted together, becoming superimposed in pairs so that each pair of two plates forms the walls of a hole 11 when the plates are fitted together. The plate also has D-shaped end bosses 12a, forming when two plates are fitted, the end slots 12. The two shells can snap-fit together, or be united by adhesive, but preferably are held by rivets or nuts and bolts in sunk-in holes, for example one between each slot 12 and its adjacent hole 11, in each plate.

Figures 4, 5 and 6 show in perspective typical structures built from units or elements.

In Figure 4, some of the rods are built up to form a rectangular frame, whilst others project at a right angle to the frame so that a four-legged ground supported structure is built. Further rods can be added, either through holes 11, or by mating end slots 12, or utilising a rod through facing slots 12 of two end-to-end rods as shown in Figure 6.

Figure 5 shows a tri-leg or brace assembly, the rods being united by utilising end slots. Further rods can be added.

Figure 6 shows another structure consisting of a base or end rectangle with upstanding rods, these being maintained in alignment by a cross-rod which serves to unite facing and

adjacent end slots of the upstanding rods.

In the construction illustrated in Figure 7, the edge of each side wall has a tongue *t* projecting for less than one half the length of the edge, and to one end, whilst to the other end a corresponding groove *g* is formed in the edge. At the centre of the edge on the one side is a pip *u*, and opposite on the other side a corresponding hole *h*. Hollow bosses *b*, *b* are formed one between D slot 12, and its adjacent hole 11.

It will be seen that two shells as above described can be fitted together, by the engagement of the tongues *t* of one in the grooves *g* of the other and the pip *u* of each in a hole *h* of the other. The two shells are held together by rivets or like means passing through aligning holes of the bosses, and the surfaces 10f, 10f of the shells are recessed to accommodate the rivet heads.

It will be appreciated that a very wide range of structures can be built up. It is proposed to market the toy as a number of rod elements or units, say twelve or more, as a set. A young child will be able to play with two rods by interfitting them, and progress using further rods.

WHAT WE CLAIM IS:—

1. A structural toy building unit, said unit comprising a rod or bar of non-circular cross-section so as to present a width greater than thickness, with at least one transverse hole therethrough with its greatest dimension along the bar and with the cross-sectional shape and dimensioning of the rod and location of the hole therethrough such that a rod or bar can slide fittingly through the or a hole of another rod or bar of identical cross-section, said rod or bar also having a slot in from each end which slots are dimensioned and shaped in relation to the cross-section of the rod or bar so that a rod or bar can be entered into a slot of another rod or bar at right angles thereto to be retained therein.

2. A unit for a structural toy as claimed in Claim 1, wherein the rod or bar has opposite faces which are flat and parallel over a substantial part of their width, with the hole or holes passing from the one flat face to the other and located centrally and extending longitudinally of the bar or rod, each end slot also passing from one flat face to the other.

3. A unit as claimed in Claim 1 or 2, having at least two holes therethrough equally spaced in relation to the end slots.

4. A unit as claimed in Claim 1 or 2, having a single hole therethrough equally spaced in relation to the end slots.

5. A unit as claimed in any one of the preceding Claims made of a synthetic plastic material by moulding and comprising two half shells joined together.

6. A unit as claimed in Claim 5, wherein each shell consists of a plate base part, flat over at least a substantial part of its area.

- with a wall part at each side of the plate part, and hollow boss parts from the flat face extending in the direction of the side walls, the shells being formed to engage by co-operating parts along the wall edges, hollow bosses of the two shells becoming superimposed to form the hole or holes through the unit and the end slots.
7. A unit as claimed in Claim 6, wherein the shells are identical and each shell has tongues and grooves along the wall edges, these being arranged so that the shells can be united with the tongues of the one received in the grooves of the other.
8. A unit as claimed in any one of the preceding Claims, wherein the or each hole is of ovoid cross-section shape with parallel flat opposite faces longitudinally of the bar or rod, and out-curving arcuate ends, the cross-section of the rod or bar corresponding with the shape of the hole and each end slot being of D-section.
9. A unit for a structural toy, said unit comprising two identical half shells of moulded synthetic plastic material, each shell being of a wide U or trough shape in cross-section, and formed with a D-slot in each end and with two hollow ovoid bosses extending in the trough from the base to the plane of the side walls, and symmetrically about the longitudinal centre line of the base, said bosses having opposite parallel walls which are parallel with the side walls of the trough, with the bosses and slots equally spaced, the edges of the side walls having tongues and grooves arranged so that the two shells can be fitted together with the tongues of one in the grooves of the other, with the cross section of the unit so formed such that it will fit slidingly through a hole of another unit, or be received in an end slot thereof.
10. A unit for a structural toy substantially as herein described with reference to the drawings accompanying the Provisional specification and the accompanying drawings.
11. A structural toy consisting of a number of units as claimed in any one of the preceding Claims.

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Agents for the Applicants.